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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,310	06/01/2001	Johannes Jacobus Van Vaals	PHN 17,651	4882

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Philips Electronics North America Corporation
80 White Plains Road
Tarrytown, NY 10591

EXAMINER

FETZNER, TIFFANY A

ART UNIT	PAPER NUMBER
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2862

DATE MAILED: 07/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/857,310

Applicant(s)
Johannes Van Vaals

Examiner
Tiffany A. Fetzn r

Art Unit
2862



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jun 1, 2001
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1035 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirements

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Jun 1, 2001 is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 3 6) ☐ Other:

Art Unit: 2862

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to because

A) There is no component **RG33**, shown in **Figure 2** as taught on page 10 in lines 8 and 13.

B) In Figure 2 component 21 connect to a blank box, no blank boxes are allowed in Figures. The blank box should be labeled.

C) Box 27 needs to be labeled "buffer" the label "#" is not acceptable as a label for a buffer component. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The abstract of the disclosure is objected to because the words "for example" occurs in line 4 of the abstract, and renders the disclosure unclear as to whether the "laser ablation of tissue" which follows the phrase is a part of the disclosed invention. The words "for example" need to be removed from line 4. Additionally the stray Fig. 1 at the bottom of the abstract should be removed. A new abstract on a separate piece of paper. Correction is required. See MPEP § 608.01(b).

4. The disclosure is objected to because of the following informalities:

Art Unit: 2862

A) Throughout applicant's disclosure the phrase "for example" occurs numerous times, and renders the scope of applicant's disclosure vague and indefinite. The examiner notes that the phrases "for example", "such as", and "or the like", render the features, scope, and claims of an application vague and indefinite. Therefore, these phrases should always be avoided. The disclosure of applicant's invention is unclear as to whether the "features or components" which follows the phrase "for example" are a part of the disclosed invention. The easiest way to eliminate the indefiniteness, and clarify the scope of applicant's invention is to just remove the phrase "for example" from every location in which it is found in applicant's disclosure. Therefore, applicant is requested to remove the phrase "for example" from the following locations in applicant's description:

A1) On page 2 see lines 6, 11-12, 14, 17, and 21.

A2) On page 3 see line 1.

A3) On page 5 see line 14.

A4) On page 6 see line 1 in two locations, lines, 11, 16, and 33-34.

A5) On page 7 see lines 2, and 27-28.

A6) On page 8 see line 17.

A7) On page 9 see line 20

A8) On page 10 see line 4. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2862

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. **Claims 1, 3, 4, 6, 7, 8, and 12** are rejected under **35 U.S.C. 102(b)** as being anticipated by **Schneider et al.**, US patent 5,711,300 issued January 27th 1998.

9. With respect to **Claim 1, Schneider et al.**, teaches and suggests “A method of forming a magnetic resonance image wherein magnetic resonance signals are acquired” [See col. 1 20-24], “the position of a measuring site is determined” [See col. 1 lines 24-27 where **Schneider et al.**, teaches that typically, the region to be imaged (i.e. interpreted as the location, or position from which images are desired) is scanned by a sequence of measurement cycles in which the Gx, Gy, and Gz magnetic field gradients vary according to the particular localization method being used. The examiner notes that “localization of the measurement signal data” suggests that the location and / or position of the subject/object/target/ or measurement site is determined, because localization automatically restricts the imaging scan, to a specific, limited area; which in the case of **Schneider et al.**, is the location or position of the tissues, that are to be measured by the MR scan. **Schneider et al.**, also teaches that “the magnetic resonance image is reconstructed from the magnetic resonance signals and on the basis of the position of the measuring site.” [See col. 1 lines 20-30; the abstract where corresponding pixels in two reconstructed images of a localized tissue slice are used to create temperature maps; for the mutual location in the reconstructed images; col. 4 lines 47 through col. 5 line 24 where **Schneider et al.**, teaches that by exciting

Art Unit: 2862

specific slices, in the region from which an image is scanned, and measurement data is obtained, an image of the actual object in within the localized measurement zone is formed.

10. With respect to **Claim 3, Schneider et al.**, teaches “a set of measuring magnetic resonance signals is acquired at a reference temperature, a set of measuring magnetic resonance signals is acquired after the temperature has been changed, notably increased, at the area of the measuring site, a reference magnetic resonance image is derived from the reference magnetic resonance signals, a measuring magnetic resonance image is derived from the measuring magnetic resonance signals,” [See col. 6 line 9 through col. 8 line 67; table 2 which shows temperature ranges for the different measurements; col. 1 line 4 through col. 2 line 5]. The examiner notes that because the reference and measurement images; obtain there phase difference information, for temperature, at corresponding pixels of the two phase images (i.e. the reference image and the measurement image) the **Schneider et al.**, reference also teaches and or suggests that “the measuring magnetic resonance image and the reference magnetic resonance image are made to register on the basis of the position determined for the measuring site.” [See abstract, col. 6 line 9 through col. 8 line 67; table 2; col. 1 line 4 through col. 2 line 5] The same reasons for rejection, that apply to **claim 1** also apply to **claim 3**.

11. With respect to **Claim 4, Schneider et al.**, teaches “The reference magnetic resonance signals and the measuring magnetic resonance signals are acquired from essentially the same region.” [See col. 6 line 9 through col. 8 line 67; table 2; col. 1 line 4 through col. 2 line 5; abstract] The same reasons for rejection, that apply to **claims 1, 3** also apply to **claim 4**.

Art Unit: 2862

12. With respect to **Claim 6**, **Schneider et al.**, teaches and suggests “A method of forming a magnetic resonance image wherein magnetic resonance signals are acquired” [See col. 1 20-24], **Schneider et al.**, suggests “the position of a measuring site is measured” [See col. 1 lines 24-27; and col. 4 lines 48-55 where **Schneider et al.**, teaches that typically, the region to be imaged (i.e. interpreted as the location, or position from which images are desired) is scanned by a sequence of “narrow” measurement cycles in which the Gx, Gy, and Gz magnetic field gradients vary according to the particular localization method being used. The examiner notes that “localization of the measurement signal data” suggests that the location and / or position of the subject / object / target / or measurement site is determined, known or measured, because localization automatically restricts the imaging scan, to a specific, known and measured, limited area; which in the case of **Schneider et al.**, is the location or position of the tissues, that are to be measured by the MR scan’. **Schneider et al.**, also teaches that “the temperature at the measuring site is derived from the magnetic resonance signals.” [See col. 5 line 17 through col. 8 line 67]. The same reasons for rejection, that apply to **claim 1** also apply to **claim 6**.

13. With respect to **Claim 7**, **Schneider et al.**, teaches and suggests that “a set of reference magnetic resonance signals is acquired at a reference temperature” [See col. 6 lines 42-44], **Schneider et al.**, suggests that “the temperature at the area of the measuring site is changed relative to the reference temperature, the temperature notably being increased at the area of the measuring site,” [See col. 5 lines 34 through col. 8 line 67; table 2 the examiner notes that in table 2 all the temperature changes go from lower values to higher values, and that in conventional MR treatments for hypothermia, the goal is to warm up a region of a patient, therefore since the

Art Unit: 2862

Schneider et al., teaches, using the method in a therapeutic manner, increasing the temperature at the measurement site is suggested by the reference. Additionally, **Schneider et al.**, teaches and suggests “a set of measuring magnetic resonance signals is subsequently acquired, and a temperature distribution is derived from the reference magnetic resonance signals, the position of the measuring site and the measuring magnetic resonance signals.” [See col. 5 lines 34 through col. 8 line 67; table 2; and the entire reference in general.] The same reasons for rejection, that apply to **claims 1, 6** also apply to **claim 7**.

14. With respect to **Claim 8**, **Schneider et al.**, teaches and suggests “a thermal image is derived from the measuring magnetic resonance signals, the reference magnetic resonance signals and the position of the measuring site, said thermal image reproducing the temperature distribution.” [See col. 5 line 17 through col. 8 line 67; the abstract]. The examiner notes that the measured, or target site of the imaged object is what the temperature or thermal images of **Schneider et al.**, reference represents. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 6, 7** also apply to **claim 8**.

15. With respect to **Claim 12**, **Schneider et al.**, teaches and suggests “A computer program containing instructions for the acquisition of magnetic resonance signals and the determination of the position of a measuring site” [See col. 2 line 26 through col. 8 line 67; Figures 1, 2], “and the reconstruction of a magnetic resonance image from the magnetic resonance imaging signals and the position determined for the measuring site.” [See Figure 2, the abstract, where images of corresponding pixels in the reference and measurement images are taught, col. 2 line 26 through col. 8 line 67.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 12**.

Art Unit: 2862

16. *Claim Rejections - 35 USC § 103*

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

19. **Claim 2, and 5** are rejected under **35 U.S.C. 103(a)** as being unpatentable over in view of **Schneider et al.**, US patent 5,711,300 issued January 27th 1998; in view of **Ishihara et al.**, US patent 5,378,987 issued January 3rd 1995.

20. With respect to **Claim 2 Schneider et al.**, teaches and suggests that “a detail and an indication of the measuring site are reproduced” [See abstract, col. 4 lines 47 through col. 5 line 24” where an image of the actual object from which the MR measurement signals are obtained, directly suggests that “a detail and an indication of the measuring site are reproduced”.

Schneider et al., lacks directly teaching that “the position of the detail in the magnetic resonance image is corrected on the basis of the position of the indication of the measuring site in the magnetic resonance image” However, **Ishihara et al.**, teaches this limitation [See col. 3 lines 21-

Art Unit: 2862

27; col. 9 line 16 through col. 10 line 50; and Figures 7 through 10 where **Ishihara et al.**, teaches an NMR method that teaches and suggests the ability to measure the temperature distribution within a target body using NMR, while accounting for the displacement of the target body during the temperature measurement, and shows/suggests from figures 9-10, correcting the indication of position for the imaged, and measured object]”

21. It would have been obvious to one of ordinary skill in the art, at the time that the invention was made, that the teachings of **Schneider et al.**, are both modifiable and combinable with the teachings of **Ishihara et al.**, because both **Schneider et al.**, and **Ishihara et al.**, teach NMR methods for producing images that are indicative of thermal changes, of the same targeted anatomy over time. **Schneider et al.**, ensures that the pixels of the respective images correspond, and **Ishihara et al.**, ensures that the anatomy corresponds by correcting for patient motion, in situations where equivalent pixels, do not show the equivalent anatomy. The same reasons for rejection, that apply to **claim 1** also apply to **claim 2**.

22. With respect to **Claim 5**, **Schneider et al.**, teaches and suggests that “a detail and an indication of the measuring site are reproduced in the reference magnetic resonance image, the same detail and the indication of the measuring site are reproduced in the measuring magnetic resonance image, and wherein a shift of the detail (i.e. a phase difference, or complex phase difference, of corresponding pixels in reference and measurement images of the same object automatically “indicates a phase shift derived from respective positions of the detail relative to the indication of the measuring site in the reference magnetic resonance image and the measuring magnetic resonance image,”) [See abstract, col. 6 line 9 through col. 8 line 67; table 2; col. 1 line

Art Unit: 2862

4 through col. 2 line 5. The examiner notes that in the **Schneider et al.**, reference the reference and measurement images, as taught by **Schneider et al.**, show the temperature changes of the same anatomy, because the pixels necessarily correspond to one another. **Schneider et al.**, lacks directly teaching that the limitation of “the position of the detail in the measuring magnetic resonance image being corrected on the basis of the derived shift of the detail.” However, **Ishihara et al.**, teaches this limitation. [See col. 3 lines 21-27; col. 9 line 16 through col. 10 line 50; and Figures 7 through 10 where **Ishihara et al.**, teaches an NMR method that teaches and suggests the ability to measure the temperature distribution within a target body using NMR, while accounting for the displacement of the target body during the temperature measurement, and shows/suggests from figures 9-10, correcting the indication of position for the imaged, and measured object]” The same reasons for rejection, that apply to **claims 1, 3** also apply to **claim 5**.

23. **Claim 9- 11** are rejected under **35 U.S.C. 103(a)** as being unpatentable over in view of **Schneider et al.**, US patent 5,711,300 issued January 27th 1998; in view of **Rasche et al.**, US patent 5,938,599 issued August 17th 1999; filed November 22nd 1996.

24. With respect to **Claim 9**, **Schneider et al.**, lacks directly teaching or suggesting “a microcoil is used to acquire position magnetic resonance signals at the area of the microcoil, and the position of the measuring site is derived from the position magnetic resonance signals.” However, **Rasche et al.**, teaches determining the nuclear magnetization in the surrounding region of an object by means of a micro-coil which is mounted on the inserted object such as a catheter, and then being able to determine the position of the object from the nuclear magnetization [See abstract] This teaching suggests applicant’s dependent feature since the measured MR signals are

Art Unit: 2862

determined from the position of the micro-coil within the object, or human subject. It would have been obvious to one of ordinary skill in the art, at the time that the invention was made, that the teachings of **Schneider et al.**, are both modifiable and combinable with the teachings of **Rasche et al.**, because the goal of the **Schneider et al.**, reference is to accurately measure in vivo temperature changes in NMR methods. The fact that **Schneider et al.**, teaches in vivo measurements suggests that a catheter, micro-coil, or invasive NMR probe is combinable with the method and system of **Schneider et al.**, since catheters, micro-coils, or invasive NMR probes are conventionally used to make In vivo NMR temperature measurements, as is well known in the MRI / NMR art. The same reasons for rejection, that apply to **claims 1, 6**, also apply to **claim 9**.

25. With respect to **Claim 10**, the references of both **Schneider et al.**, and **Rasche et al.**, teach and suggest "A magnetic resonance imaging system provided with a coil system for acquiring magnetic resonance signals and for determining the position of a measuring site, and a reconstruction unit for the reconstruction of a magnetic resonance image from the magnetic resonance imaging signals and the position determined for the measuring site." [See **Schneider et al.**, Figures 1, 2, col. 2 line 19 through col. 8 line 67; **Rasche et al.**, Figures 1, 2, 5; the abstract; col. 1 line 50 through col. 7 line 62]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 6, 9** also apply to **claim 10**.

26. With respect to **Claim 11**, **Schneider et al.**, lacks directly teaching or suggesting "a microcoil for the acquisition of position magnetic resonance signals at the area of the microcoil, and wherein the reconstruction unit is arranged to derive the magnetic resonance image from the

Art Unit: 2862

magnetic resonance signals and on the basis of the position magnetic resonance signals.”

However, **Rasche et al.**, teaches and suggests this limitation for the same reasons as those give in the rejection of claim 9 which need not be reiterated. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 6, 9, 10** also apply to **claim 11**.

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. .

- A) **Van Vaals et al.**, US patent 5,938,600 issued August 17th 1999.
- B) **Van Vaals et al.**, US patent 6,064,206 issued May 16th 2000.
- C) **Zhou et al.**, US patent 6,377,834 B1 issued April 23rd 2002 filed April 24th 2000.
- D) **Van Vaals et al.**, PCT WO 99/21024 published April 29th 1999.
- E) **Van Vaals**, PCT WO 01/25810 published April 12th 2001; which corresponds to the instant application and is just noted for the purposes of a complete record. .

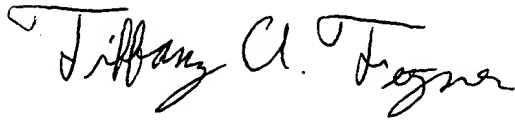
Conclusion

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is (703) 305-0430. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

29. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz, can be reached on (703) 305-4816. The fax phone number for the organization where this application or proceeding is assigned is (703)305-3432 .

Art Unit: 2862

30. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0956.



TAF

July 26, 2002



EDWARD LEFKOWITZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800